

Application No. 10/526,382  
Amendment dated May 21, 2007  
Reply to Office Action of February 21, 2007

Docket No.: 21854-00051-US1

**AMENDMENTS TO THE DRAWINGS**

In Figures 1a and 1b, “Prior Art” has been added.

Attachment: Replacement Sheet (1 sheet)

**REMARKS**

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Prior art legends have been added to Figs 1a and 1b of the Drawings as required by the Examiner

Claims 4, 13 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 4-5, insofar as in compliance with 35 U.S.C. § 112, are rejected under 35 U.S.C. § 102(e) as being anticipated by Mikami et al. (6,344,991). Claims 6, 13 insofar as in compliance with 35 U.S.C. § 112, rejected under 35 U.S.C. § 103(a) as being unpatentable over Mikami et al. Claims 7, 9 insofar as in compliance with 35 U.S.C. § 112, rejected under 35 U.S.C. § 103(a) as being unpatentable over Mikami et al. in view of Soref et al. (5,880,491). Claims 8, 10 insofar as in compliance with 35 U.S.C. § 112, rejected under 35 U.S.C. § 103(a) as being unpatentable over Mikami et al. in view of Forbes et al. (6,965,123). Claims 21 insofar as in compliance with 35 U.S.C. § 112, rejected under 35 U.S.C. § 103(a) as being unpatentable over Mikami et al. and Forbes et al. as applied to claim 10, and further in view of Chu (7,145,167).

Original claims 4 to 10 and 13 and 21 have been canceled and are now presented as corresponding claims 25-31, 32 and 33. These claims deal with the Examiner's queries on the clarity of the claims. New claims 34-42 are also presented and are of slightly wider scope.

The newly claim 34 is directed to "a one transistor cell for use as a memory device for storing information, said cell having a control gate, a floating gate and source and drain terminals wherein a silicon carbide device is disposed between the control gate and the floating gate and information is read by sensing resistance between the source and drain terminals of the transistor."

The preferred Si C device is an isolated diode. A diode is a switch that cannot be controlled by a third electrode. So if a diode is used instead of the controlled switch (transistor), which is used in the standard DRAM cell the independent control of the on/off mode of the switch, is lost.

The advantages of using a diode instead of the controlled switch (transistor) are not obvious. There are no advantages if the thinking is limited to electrical characteristics and circuits. The important advantage of this invention relates to the greater ability to reduce the dimension of the memory cell with diode isolation. For decades, the cell dimension was not a weakness of the standard DRAM cell (transistor isolation). However, the straightforward reduction of DRAM cell size (needed for increase in memory capacity) is coming to an end and this invention provides an opportunity for dramatic improvement.

Mikami(US 6344991) has no disclosure of using silicon carbide disposed between the control and floating gates of a one transistor cell.

Mikami's patent has one instance where "silicon carbide" is mentioned (column 12, line 5) as a possible choice for the layer that is applied to their ferroelectric material. As far as the material itself is concerned, Mikami could use SiC, but in the form of sintered ceramic. In this invention it is used as a semiconductor crystal with P-type and N-type doped regions. As far as the purpose of the diode is concerned, Mikami uses SiC as a variable resistor (varistor). The memory cell of this invention cannot work if the isolating diode is replaced by a variable resistor. We need the diode to act as an open circuit (insulator) during the charge-storage mode. If replaced by a variable resistor, the charge would leak promptly. In Mikami's patent, this kind of charge leakage is irrelevant because the information is stored in the property of the ferro-electric material. What could be confusing is that the relevant property of the ferroelectric material is related to charge dipoles, but this charge should not be confused with the mobile charge that acts as current carriers.

A person having ordinary skill in the art would find the links between the memory cell of this invention and ferro-electric memories as disclosed in Mikami far fetched, therefore, far from obvious.

One skilled in the art would not combine disclosure of Silicon carbide elements from other patents with Mikami unless they were able to function as varistors which is the use proposed by Mikami. Thus the combination with Soref (US 5880491) suggested by the Examiner would not be made.

Forbes (US 6965123) discloses a Silicon carbide floating gate but does not disclose a silicon carbide device between a floating gate and a control gate. Where Forbes discloses long charge retention times for the floating gate structure it is admitted (Col 8 line 3) that the layer is no longer silicon carbide but pure silicon. Applicant submits that the Examiner has taken the Forbes disclosure out of context.

The additional combination with Chu (USA 7145167) is based on a misreading of Chu. Chu does not disclose forming a silicon oxide layer on silicon carbide and nitriding in the presence of NO or N<sub>2</sub>O. The disclosures referred to by the Examiner do not mention details of the method of nitriding and refer to forming this on a SiGe layer not SiC.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 22-0185, under Order No. 21854-00051-US1 from which the undersigned is authorized to draw.

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Respectfully submitted,

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